

SEP 25 1996

Students First

A Guide for Students

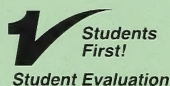
Preparing to Write
the Biology 30
Diploma Examination

Preparing to Write the Biology 30 Diploma Exam

Dear Student:

The authors of this guide are staff from the Student Evaluation Branch. These are the people who actually put together the exam you will be writing. They also organize the marking sessions and train the teachers who mark the exams. These people see first-hand what thousands of students are doing right (and wrong) when they write an exam.

This guide and all other diploma exam-related materials produced by Student Evaluation Branch staff are identified with the logos



I hope you will find this guide helpful. Good luck on exam day!

*Frank Horvath, Director
Student Evaluation Branch*

Getting ready

✓ Start now

The best way to prepare for the Biology 30 Diploma Exam is to start with a positive attitude and establish excellent study habits. Set yourself up for success right at the start of the course.

The work you do in class prepares you for the diploma exam and is worth 50% of your final mark. Therefore, you should strive for the highest possible class mark. Start by actively participating in every class. Create a good set of study notes and review them often. Pay close attention to all Biology 30 lab activities and demonstrations. You will gain confidence and skill by redrawing and labelling all biological diagrams and processes. After school, you should keep up with class work and review the topics by reading your textbook.

The skills and knowledge you gain in the course are essential to your success on the Biology 30 Diploma Exam.

✓ **Understand the parts of the exam**

The Biology 30 Diploma Exam consists of

- 48 multiple-choice questions worth **one mark each**
- 8 numerical-response questions worth **one mark each**
- 1 (data-base) closed-response written question worth **twelve marks**
- 1 (essay) open-response written question worth **twelve marks**

The exam is worth 80 marks in total and is designed to be completed in 2.5 hours, however, you are allowed 3 hours to complete the exam.

✓ **Understand the machine-scored parts of the exam**

This part of the Biology 30 Diploma Exam consists of multiple-choice and numerical-response questions.

Multiple-choice questions are worth one mark each and require you to select the “best” answer. There is no penalty for guessing — never leave an answer blank!

Numerical-response questions are worth one mark each and require you to fill in the correct sequence of numbers on your answer sheet. Examine the following examples and be sure you are familiar with each type of numerical-response question.

Numerical Response *Calculation Question and Solution*

- 1.** A man of unknown genotype with blood type A and a woman with blood type O are going to have a child. Depending on the man’s genotype, the minimum probability that the child will have blood type O is zero. What is the maximum probability that the child will have blood type O?

Answer: _____

(Record a value from 0 to 1, rounded to two decimal places in the numerical-response section of the answer sheet.)

Answer: 0.50.

Fill in:

0	.	5	0
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	0	0	<input type="radio"/>
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	<input checked="" type="radio"/>	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

Use the following information to answer the next question.

Some Amino Acids

1. Aspartate
2. Cysteine
3. Glutamate
4. Histidine
5. Leucine
6. Phenylalanine
7. Proline
8. Tryptophan

Numerical Response Selection Question and Solution

- 2.** Provide the correct sequence of numbers that represent the amino acids coded by the DNA nitrogen-base sequence show below. Read the DNA code beginning at the left.

–G–G–T–G–G–G–C–T–A–

*Answer: _____

(Record your answer in the numerical-response section of the answer sheet)

Enter the first digit of your answer in the left-hand box and leave any unused boxes blank.

Answer: 7, 7, 1.

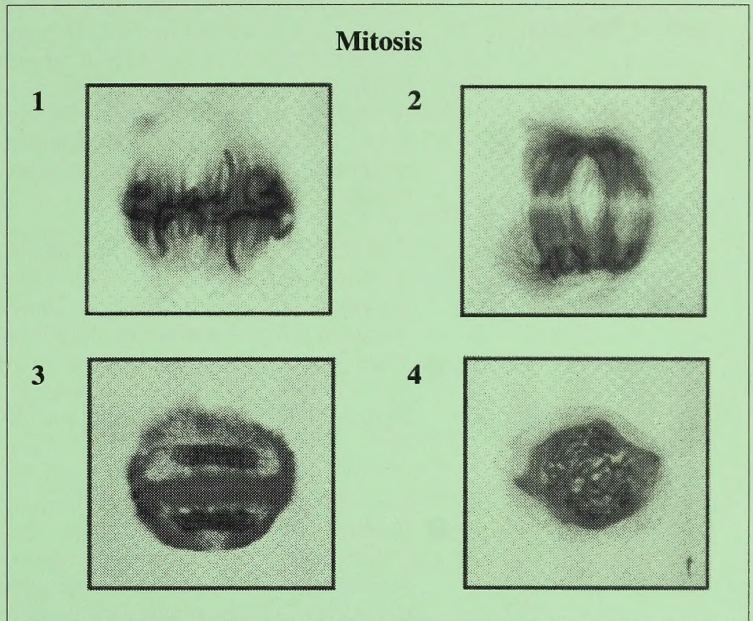
Fill in:

7	7	1	
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<input type="radio"/>	<input type="radio"/>		
<input type="radio"/> 0	<input type="radio"/> 0	<input type="radio"/> 0	<input type="radio"/> 0
<input type="radio"/> 1	<input type="radio"/> 1	<input checked="" type="radio"/> 1	<input type="radio"/> 1
<input type="radio"/> 2	<input type="radio"/> 2	<input type="radio"/> 2	<input type="radio"/> 2
<input type="radio"/> 3	<input type="radio"/> 3	<input type="radio"/> 3	<input type="radio"/> 3
<input type="radio"/> 4	<input type="radio"/> 4	<input type="radio"/> 4	<input type="radio"/> 4
<input type="radio"/> 5	<input type="radio"/> 5	<input type="radio"/> 5	<input type="radio"/> 5
<input type="radio"/> 6	<input type="radio"/> 6	<input type="radio"/> 6	<input type="radio"/> 6
<input checked="" type="radio"/> 7	<input checked="" type="radio"/> 7	<input type="radio"/> 7	<input type="radio"/> 7
<input type="radio"/> 8	<input type="radio"/> 8	<input type="radio"/> 8	<input type="radio"/> 8
<input type="radio"/> 9	<input type="radio"/> 9	<input type="radio"/> 9	<input type="radio"/> 9

*Note: To answer this question, it is necessary to use the data pages provided with every diploma examination.

Use the following information to answer the next question.



Numerical Response *Correct-order Question and Solution*

- 3.** Normal cell division (mitosis) is a process involving a specific sequence of events. Provide the correct sequence of the mitotic events shown in the photographs.

Answer: _____

(Record your four digit answer in the numerical-response section of the answer sheet)

Answer: 4, 1, 2, 3. Fill in:

4	1	2	3
⊙	⊙		
⓪	⓪	⓪	⓪
①	●	①	①
②	②	●	②
③	③	③	●
●	④	④	④
⑤	⑤	⑤	⑤
⑥	⑥	⑥	⑥
⑦	⑦	⑦	⑦
⑧	⑧	⑧	⑧
⑨	⑨	⑨	⑨

✓ **Understand the written-response part of the exam**

This part of the Biology 30 Diploma Exam consists of two types of written-response questions. The data base written-response question is worth 12 marks. This section requires you to read the scientific article provided and answer a series of related questions. There is one or more correct answer for each question. Use the data given in the article and your knowledge of Biology 30 to solve each question. You will be expected to support and develop your response by referring to information and data provided in the article.

The second type of written-response question is an essay-response question worth 12 marks. You will read the scientific article provided and write an essay to answer the written-response question. There is no prescriptive answer to this question. The mark you receive will be based on your knowledge and understanding of biological ideas, and your use of data and information provided, and your ability to communicate these.

✓ **Understand the calculator policy**

The Calculator Policy can be found in the *Biology 30 Information Bulletin, Diploma Examinations Program*. Read it carefully. Students are expected to use scientific calculators when writing diploma examinations in mathematics and science. Calculator memories must be cleared of all stored information except for the formulas that appear on the data tear-out pages or in the data booklets and the programs used for graphing quadratic relations in Math 30/33. It is **your responsibility** to ensure there is no information stored in the calculator you are using except what is specifically allowed by this policy. Failure to do this is a breach of exam procedures and is considered cheating. It is not worth taking a chance. If you are unfamiliar with how to clear calculator memories, talk to your teacher.

What you can do to prepare

✓ **Plan ahead**

Schedule review periods *well* in advance. Keep your reviews short and frequent. Create review tools, such as summaries of class/text notes of each unit, and flashcards of biological diagrams and processes. Make a study checklist of everything you need to know for the exam. Include major unit topics, past exams, quizzes, and labs.

✓ **Suggested study calendar**

Prepare a calendar to schedule time to study and review the items on your checklist. As the diploma examination date nears, you should be crossing off items and days as you review them.

Biology 30 Suggested 14-day study schedule (at one hour per day)

Day 1 Parts of the neuron, Neuron physiology, Synapses	Day 2 Nervous System: CNS, Peripheral NS, Types of neurons	Day 3 Specialized senses (ear, eye, taste, smell, touch and temperature)
Day 4 Principles of hormone action, Types of hormones, Endocrine glands and their hormones (function)	Day 5 Reproductive structures and hormones, STDs	Day 6 Conception, Pre- embryonic, embryonic, fetal development, and childbirth, Reproductive technologies
Day 7 Cell cycle, Mitosis, Meiosis, Diversity in reproductive strategies	Day 8 Genetics: Monohybrid cross, Test-cross, Incomplete dominance, Codominance, Multiple Alleles, Sex-linkage	Day 9 Probability, Dihybrid crosses, Pedigrees, Gene linkage, and Chromosome maps
Day 10 DNA, RNA, Transcription, Translation, Gene mutation, Recombinant DNA technologies, and applications	Day 11 Population genetics & interactions: Hardy- Weinberg, Gene pools, Populations, Communities, Symbioses, Competition, Succession	Day 12 Population ecology: Population size/density, Growth rates and curves, Life- histories, Survivorship curves, Chaos theory
Day 13 Review material from days 1 to 6	Day 14 Review material from days 7 to 12	EXAM DAY

✓ Exam day

On exam day, arrive early and get organized. Remember to relax and do your best. Mark questions you can't answer immediately and come back to them later. Pace yourself and answer every question.

✓ Exam materials

You are responsible for providing your own HB pencil, pen, highlighter, eraser, calculator, etc. for writing the diploma exam. No dictionaries or texts are allowed.

✓ Who will mark your exam?

Your exam will be marked by Biology 30 teachers who know the text and course content that you have studied.

How to do your best when writing the exam

✓ Read carefully

Start by reading the instructions, then read over the question or questions that you will be answering. Carefully read all the information and data given in the scientific article or in the context provided. Underline or use a highlighter pen to emphasize key words and ideas that may be used to answer the question(s).

✓ Organize your writing

Both types of written-response questions are an opportunity for you to demonstrate your understanding of biology. Focus on the question and create a rough list of all the pertinent concepts, terms, and ideas in the article and from the course. Select the best information to answer the question and plan what you will write. Before you write your essay, make a quick outline. Stay focused on the question, and remember to support your ideas with data from the article.

✓ Express yourself

Your written response must be convincing, informative, and clearly written. Use any means of expression that will strengthen your answer. You may choose to include examples, graphs, tables, or diagrams—just be sure your information is correct.

A written response that provides *only* information from the article is not as valued as a written response that correctly contains information from the article to support well-thought-out ideas and explanations learned in Biology 30.

✓ Show your skills

Wherever possible, use correct biological terms and examples. Remember to demonstrate your knowledge of biology and your knowledge of the scientific process. You are required to extract pertinent scientific information in support of your *knowledgeable* answer.

✓ Try to relax

This may seem impossible. However, studies have shown that by relaxing, you will increase your ability to recall facts, stay focused, and organize your thoughts. Be prepared for the exam, get a good sleep, and eat something like a chocolate bar before the exam.

During the exam, take a few deep breaths, chew gum, and keep an eye on the clock. Budget your time so that you don't feel pressured. Stay calm and relaxed as you complete the exam. Answer every question and give the exam your best possible effort.

Additional Reminders

✓ Further information

For more detailed information about the Biology 30 diploma exam, ask your teacher about a booklet from Alberta Education called the *Biology 30 Information Bulletin*. Each Biology 30 teacher in Alberta will have a copy.

This bulletin contains a great deal of information about the diploma examination as well as the scoring criteria used by markers to evaluate your written work.

Familiarize yourself with the Appendices of this document.

- Appendix A—Science Process Words
- Appendix B—Directing Words

✓ Rescores

You may request a rescoring of your exam if you believe that the mark you have received is not appropriate. Before applying for a rescoring, be sure to check your *Diploma Examination Results Statement* to review the marks distribution for your exam. Your machine-scored marks are not likely to change, but your written-response marks may change slightly. Keep in mind that if you do request a rescoring, your new mark, whether it increases *or decreases*, will be your final mark. The fee for this service is \$26.75, which includes the G.S.T.

✓ Rewrites

You may rewrite a diploma examination at regularly scheduled exam periods. You must apply to the Student Evaluation Branch by November 15 to write the January exam and by April 15 to write the June exam. The fee for this service is \$26.75, which includes the G.S.T. (For more details, see the *General Information Bulletin*.)

✓ Other questions

If you have questions about the exam that your teacher can't answer or if you are a student without a regular classroom teacher, feel free to call

Mrs. Karen Slevinsky, Biology 30 Examination Manager

or

Mr. Phill Campbell, Assistant Director, Math/Science Diploma Exams
at 403-427-0010.

To call toll-free from outside of Edmonton, dial 310-0000.

Good Luck!

Appendix A

Science process words

Hypothesis:	A single proposition intended as a possible explanation for an observed phenomenon; e.g., a possible cause for a specific effect
Conclusion:	A proposition that summarizes the extent to which a hypothesis and/or a theory has been supported or contradicted by the evidence
Experiment:	A set of manipulations and/or specific observations of nature that allow the testing of hypotheses and/or generalizations
Variables:	<p>Conditions that can change in an experiment. Variables in experiments are categorized as:</p> <ul style="list-style-type: none">• <i>manipulated variables</i> (independent variables)—conditions that were deliberately changed by the experimenter• <i>controlled variables</i> (fixed or restrained variables)—conditions that could have changed but did not, because of the intervention of the experimenter• <i>responding variables</i> (dependent variables)—conditions that changed in response to the change in the manipulated variables
Technology:	<p>The development of our understanding of science is directly related to the development of technology. The meaning of technology has many facets, but in general, technology refers to a way of doing something. This includes the development of tools and new techniques for solving problems. It also includes ideas and their organization for achieving practical purposes. In the context of an examination question, technology includes both these facets of meaning. That is, a technological explanation should include not only identification and descriptions of equipment (tools, products) but also explanations of procedures.</p>

Appendix B

Directing words

Contrast/Distinguish

Point out the *differences* between two things that have similar or comparable natures

Compare

Examine the character or qualities of two things by providing characteristics of both that point out their mutual *similarities* and *differences*

Conclude

State a logical end based on reasoning and/or evidence

Criticize

Point out the *merits* and *demerits* of an item or issue

Define

Provide the essential qualities or meaning of a word or concept; make distinct and clear by marking out the limits

Describe

Give a written account or represent the characteristics of something by a figure, model, or picture

Design/Plan

Construct a plan, i.e., a detailed sequence of actions, for a specific purpose

Discuss

The word “discuss” will not be used as a directing word on math and science diploma examinations because it is not used consistently to mean a single activity

Enumerate

Specify one by one or list in concise form and according to some order

Evaluate

Give the significance or worth of something by identifying the good and bad points or the advantages and disadvantages

Explain

Make clear what is not immediately obvious or entirely known; give the cause of or reason for; make known in detail

How

Show in what manner or way, with what meaning

Hypothesize

Form a tentative proposition intended as a possible explanation for an observed phenomenon; i.e., a possible cause for a specific effect. The proposition should be testable logically and/or empirically

Identify

Recognize and select as having the characteristics of something

Illustrate

Make clear by giving an example. The form of the example must be specified in the question; i.e., word description, sketch, or diagram

Infer

Form a generalization from sample data; arrive at a conclusion by reasoning from evidence

Interpret

Tell the meaning of something, present information in a new form that adds meaning to the original data

Justify/Show How

Show reasons for or give facts that support a position

Outline

Give, in an organized fashion, the essential parts of something. The form of the outline must be specified in the question; i.e., lists, flow charts, concept maps

Predict

Tell in advance on the basis of empirical evidence and/or logic

Prove

Establish the truth, validity, or genuineness of something by giving factual evidence or logical reasons

Relate

Show logical or causal connection between things

Solve

Give a solution for a problem; i.e., an explanation in words and/or numbers

Summarize

Give a brief account of the main points

Trace

Give a step-by-step description of the development

Why

Show the cause, reason, or purpose

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